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# What Happens to Students Who Take Community College “Dual Enrollment” Courses in High School?

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# Inside This Report

The number of high school students taking community college courses has grown dramatically since the early 2000s as students and their families have seized on the potential of “dual enrollment” to give students a jump-start on college and save money by finishing college faster. Numerous studies have shown that dual enrollment participants are more likely than nonparticipants to graduate high school, go on to college, and complete college degrees. Despite the growing prevalence and potential benefits of dual enrollment, many colleges and states have not closely monitored which students participate, where they enroll in college after high school, and how many complete a college degree.

In this report, we use student enrollment and degree records from the National Student Clearinghouse (NSC) to examine who enrolls in community college dual enrollment courses and what happens to them after high school. We focus on students who took college courses offered by community colleges because those institutions provide the majority of dual enrollment offerings nationally.

We tracked more than 200,000 high school students who first took a community college course in fall 2010 for six years, through summer 2016 (five years after high school). Eighty-eight percent of these students continued in college after high school, and most earned a certificate or degree or transferred from a two-year college to a four-year college within five years. What type of college former dual enrollment students attended after high school and how many completed a college credential varied greatly by state, and many states showed big disparities in credential completion rates between lower and higher income students. The following are among the report’s key findings:

- **Nationally, 15 percent of fall 2010 community college entrants were high school dual enrollment students; this proportion ranged from 1 percent in Georgia to 34 percent in Kentucky.** (The numbers have likely grown since then.) Nearly two thirds of community college dual enrollment students nationally were from low- or middle-income families—about the same proportion as students who start in a community college after high school.
- **Nearly half of former community college dual enrollment students first attended a community college immediately after high school,** and 84 percent of those students reenrolled at the college where they had taken dual enrollment courses. Forty-one percent of former dual enrollment students went to a four-year college after high school. Only 12 percent did not enroll in any college by age 20.
- **Among former dual enrollment students who started at community college after high school, 46 percent earned a college credential within five years.** The percentage ranged from 28 percent in West Virginia to 64 percent in Florida. In addition to Florida, more than half of students in 12 other states, including Minnesota, Mississippi, and Washington, earned a college degree or certificate. In 13 states, there were gaps of 10 or more percentage points in completion rates between lower and higher income students who first enrolled in a community college after high school. Minnesota, Missouri, and Iowa had more parity in completion rates.

- **Among former dual enrollment students who started at a four-year college after high school, 64 percent completed a college credential within five years.** Completion rates ranged from 34 percent in Nevada to 75 percent in Florida. In nine states, including Florida, Illinois, Iowa, Maryland, and Virginia, more than 70 percent of students earned a college credential. Most states had achievement gaps between lower and higher income former dual enrollment students who entered a four-year college after high school, and there were 23 states with gaps of 10 or more percentage points. In New Jersey, Kansas, Ohio, California, and Texas, the gaps were 20 percentage points or more.

Taking college courses in high school has the potential to help students make progress toward a college credential more efficiently. This study shows that among former community college dual enrollment students who first enrolled in a community college after high school, 46 percent completed a certificate, associate degree, or bachelor's degree within five years. Other research using similar data has found that only 39 percent of students who started community college after high school earned any college degree or certificate within six years. Among former community college dual enrollment students who started at a four-year college after high school, 64 percent completed a college credential within five years. Other research has found the same completion rate among students entering four-year institutions nationally after high school, but within six years.

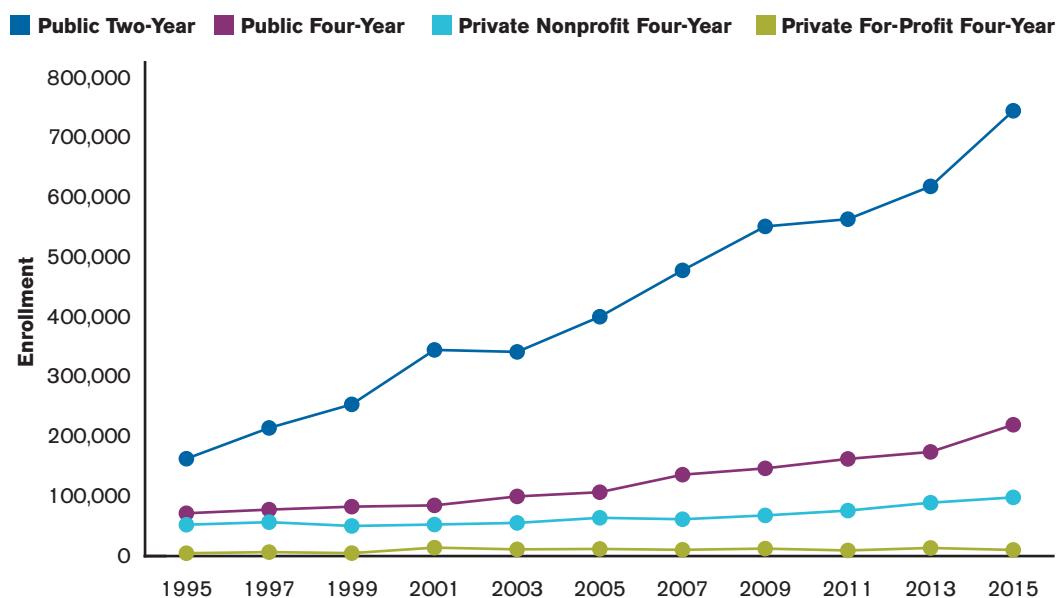
Despite the potential benefits of dual enrollment, the research raises important questions about why students in some states do substantially better in college than those in others and why there are large achievement gaps between different income groups in some states. If colleges are to improve rates of college-going and completion by dual enrollment students generally, and by those from disadvantaged backgrounds in particular, they will need to monitor their dual enrollment students more closely, both while they are in high school and after they graduate. Colleges can begin by running analyses using the outcome measures presented in this analysis, and they can merge NSC data with their own student records to further disaggregate outcome data by high school, race/ethnicity, and other student characteristics of interest. Using the results presented here, colleges could benchmark their performance against aggregate outcomes for other two- or four-year institutions nationally and in their state. The findings from such analyses will be a good starting point for colleges, working with their high school partners, to examine what strategies are working to help dual enrollment students not only enroll in college after high school but also earn college credentials in a timely fashion, and what additional steps are needed to improve college access and success for all students.

# Introduction

A growing number of students are taking college courses while they are in high school. Based on data from the National Center for Education Statistics (NCES), we estimate that the number of high school “dual enrollment” students grew 67 percent from 2002 to 2010, to a total of nearly 1.4 million in the 2010–11 academic year, the most recent year for which NCES reported national data on dual enrollment students.<sup>1</sup> There is strong evidence that the number of dual enrollment students nationally has increased since that time.<sup>2</sup> In some states, the growth of dual enrollment has been even more pronounced. For example, according to data collected by the Texas Higher Education Coordinating Board, about 28,000 high school students took dual enrollment courses at a Texas community college in fall 2002, accounting for about 5 percent of all community college enrollments that fall. By fall 2016, the number had grown to more than 140,000—representing nearly 20 percent of fall community college enrollments in the state.<sup>3</sup>

While high school students take courses at both two- and four-year institutions, most do so at community colleges. Data from the Integrated Postsecondary Education Data System (IPEDS) on the number of students aged 17 or younger enrolled in college courses, a proxy for high school dual enrollment, indicate that the growth in dual enrollment is concentrated in the community college sector. As shown in Figure 1, from 1995 to 2015, fall enrollments of students aged 17 or younger at public four-year institutions grew from 72,000 to 220,000, while at community colleges they grew from 163,000 to 745,000.<sup>4</sup> These data indicate that community colleges’ “market share” of students aged 17 or younger taking college courses increased from 56 percent in 1995 to 69 percent in 2015.

**Figure 1. Fall Undergraduate Enrollments Among Students Aged 17 or Younger by Sector, 1995–2015**



*Note.* Data obtained from IPEDS.

Previous research indicates that taking college courses in high school benefits students in a number of ways. A recent report from the federal What Works Clearinghouse summarized findings from studies on dual enrollment that meet the clearinghouse's evidence standards. The review found positive effects of dual enrollment on several outcomes, including high school grades and completion, college enrollment, college credit accumulation, and college degree completion (U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse, 2017).

Dual enrollment seems particularly beneficial for students from underserved groups. In one study cited in the What Works Clearinghouse report, An (2013) used national survey data and found positive effects of dual enrollment participation on bachelor's degree attainment among participants, compared with nonparticipants with similar student and family characteristics, measures of student achievement, and high school characteristics. The effects were particularly strong for first-generation college students and students with parents who had some college but no degree. Yet the benefits of dual enrollment for students from underserved groups may vary based on local or state context. For example, Taylor's (2015) analysis of dual enrollment in Illinois found smaller, though still positive, effects on college-going and degree completion among lower income students and students of color compared with other dual enrollment participants.

Recent national data suggest that dual enrollment may also accelerate degree completion. In a 2016 report from the National Student Clearinghouse (NSC) Research Center, Shapiro et al. found that former dual enrollment participants who subsequently enrolled at a public four-year college and completed a bachelor's degree did so, on average, one year sooner than did other completers who did not participate in dual enrollment. Among associate degree earners, former dual enrollment participants completed their degree nearly two years earlier, on average, than did nonparticipants.

Despite the growing prevalence and potential benefits of dual enrollment, many colleges and states have not closely monitored which students participate, where they enroll in college after high school, and how many complete a college degree. In this report, we use data from NSC to examine who enrolls in dual enrollment courses and what happens to them after high school. We focus on students who took college courses at community colleges, since those institutions provide the majority of dual enrollment offerings nationally. Our analysis examines three broad questions:

1. What are the characteristics of community college dual enrollment students?
2. Where do they enroll in college after high school?
3. What are their college outcomes?

Not all dual enrollment courses are delivered in the same manner. Some are taught by credentialed teachers in high schools, some are taught on college campuses, and some are offered online. A growing number of colleges have established early college high schools, which provide a more comprehensive curriculum, not just discrete courses. The NSC data used in our analyses do not provide information about the delivery method of the dual enrollment courses. They do not indicate which courses students take or whether the college credits they earn apply toward a degree, nor do they take into account the eligibility criteria for participating in dual enrollment, which vary by state and in some cases by college. Still, they afford a high-level view of who enrolls in community college dual enrollment courses, where these students enroll after high school, and how successful they are in earning degrees. We hope the results of these analyses will raise further questions that colleges and states will want to answer with their own more detailed datasets.

## Data Definitions

We used student enrollment and degree record data from NSC on a cohort of first-time-in-college (FTIC) students who entered higher education at a community college in the fall of 2010. We classified students who were younger than 18 years old at the time of their first enrollment as “high school dual enrollment students”<sup>5</sup> and those who were 18 or older at the time of their first enrollment as “post-HS community college entrants.” With the exception of Figure 2, which shows dual enrollment students as a proportion of all FTIC community college entrants, our results compare dual enrollment participants with students who entered a community college for the first time after high school and were identified as “degree-seeking.”<sup>6</sup> We used a proxy measure based on data from each student’s home census tract to classify students based on family income.<sup>7</sup>

To estimate where former dual enrollment students enrolled in college after they graduated high school, we classified former dual enrollment students by the type of college at which they first matriculated at ages 18–20.<sup>8</sup> In doing so, we assumed that fall 2011 was the first possible post-high-school college-going term for students who were 17 years old when they participated in dual enrollment in fall 2010, that fall 2012 was the first possible post-high-school college-going term for students who were 16 years old when they participated in dual enrollment in fall 2010, and so on for 15- and 14-year-old dual enrollment participants.

In looking at former dual enrollment students’ college attainment outcomes, *we focus solely on students who first participated in high school dual enrollment at a community college at age 17 in fall 2010*. Examining this subset of students allows us to track a group of students who are more similar—in that they had the same “starting point”—than if we were to combine age groups. However, a limitation of this approach is that we are only tracking the attainment outcomes of students who participated in high school dual enrollment during their senior year of high school. We monitor these students’ highest credential earned<sup>9</sup> through the summer of 2016, six years after their initial participation in dual enrollment and five years after they should have finished high school. Throughout the report, we refer to this tracking period as “five years after high school.”

Our procedure to estimate when former dual enrollment students completed high school and first started college has some limitations. For example, while most high school students enter their junior year at age 16, some former dual enrollment students may have begun their junior year at age 17 and continued taking dual enrollment courses at age 18, during their senior year of high school. In such cases, we would have misclassified these students as first matriculating to a community college after high school, resulting in an overestimation of the percentage of former dual enrollment students who first enrolled at a community college at ages 18–20. Students who skipped grades or were held back might be cases that violate the assumptions of this procedure. To address these limitations, we also report former dual enrollment students’ first college matriculations at ages 19–20, which allows for a gap year between their assumed high school graduation and first post-high-school college enrollment. However, we do not use this as the primary method, given the substantial number of students who first enroll at a community college after high school and transfer within one year. Overall, our sample included 1,406,594 FTIC students, 845,034 of whom were degree-seeking post-HS community college entrants and 213,780 of whom we classified as high school dual enrollment students.<sup>10</sup>

# What Are the Characteristics of Community College Dual Enrollment Students?

## Nationally, 15 percent of fall 2010 community college entrants were high school students; this proportion ranged from 1 to 34 percent among states.

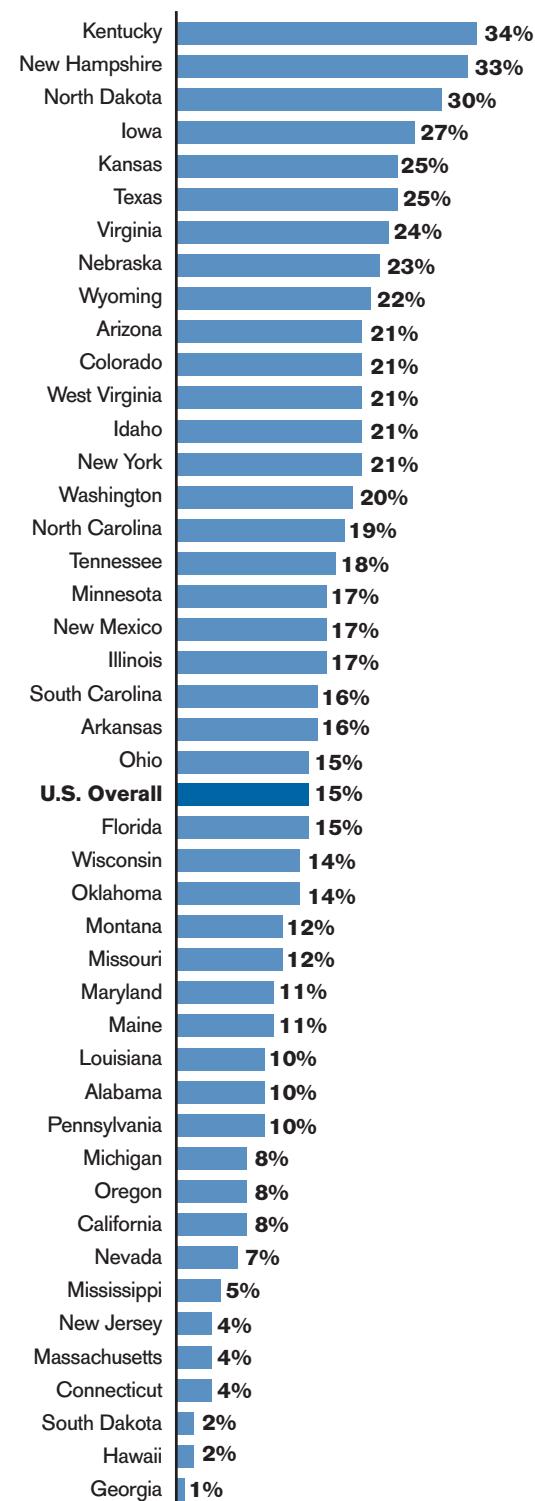
Nationally, 15 percent of students who started college for the first time in a community college in fall 2010 were 17 years old or younger (our proxy indicator of being a high school dual enrollment student). As shown in Figure 2, the ratio of FTIC dual enrollment students to FTIC post-HS community college entrants varied by state. Some states, such as Kentucky, New Hampshire, North Dakota, and Iowa, had relatively high proportions of high school dual enrollment students compared with post-HS community college entrants. Other states, including Georgia, Hawaii, South Dakota, and Connecticut, had lower proportions of dual enrollment students at community colleges. Readers should note that there could be higher levels of high school dual enrollment than reported here in some states, if a substantial amount of dual enrollment occurs at four-year institutions.

As shown in Table 1, 3 percent of dual enrollment students nationally were 14 years old when they first enrolled in fall 2010, 7 percent were 15 years old, 29 percent were 16 years old, and 61 percent were 17 years old. Compared with post-HS degree-seeking community college entrants, the dual enrollment group included more female students (58 versus 53 percent). Surprisingly, dual enrollment and post-HS community college entrants were similarly distributed in terms of family income.<sup>11</sup>

**Table 1. Demographics of Community College Dual Enrollment Students and Post-High-School Degree-Seeking Students**

Characteristic	Dual Enrollment Students	Post-HS Community College Entrants
<b>Age</b>		
14	3%	
15	7%	
16	29%	
17	61%	
<b>Gender</b>		
Female	58%	53%
Male	42%	47%
<b>Household Median Income (Census Tract)</b>		
Lower income	37%	39%
Middle income	24%	23%
Higher income	38%	37%
<b>N</b>	213,780	845,034

**Figure 2. Dual Enrollments as a Percentage of FTIC Community College Enrollments in Fall 2010, by State**



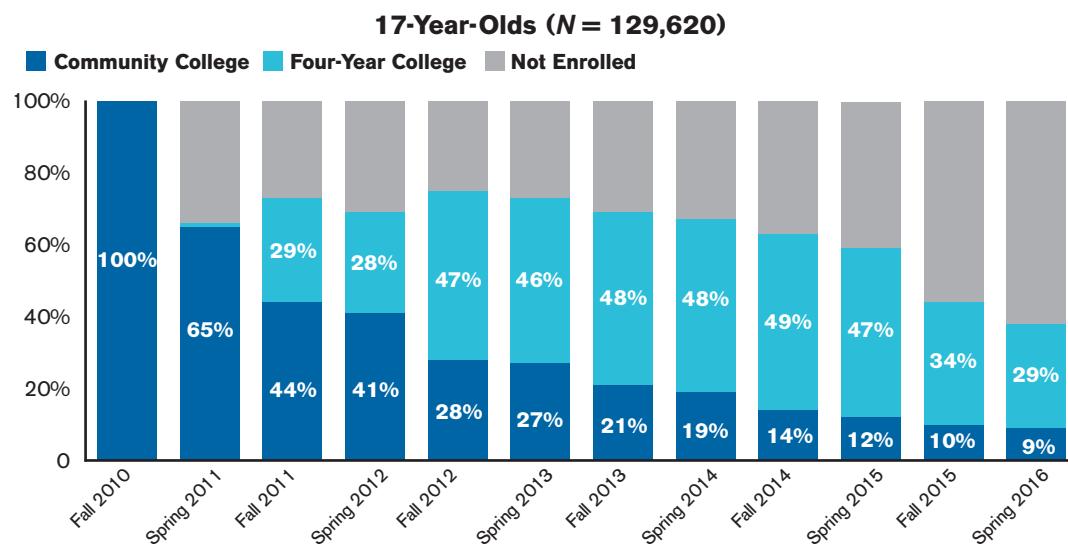
*Note.* For confidentiality, results for states with fewer than three community colleges are withheld. For full results, see the appendix to this report, available at <https://ccrc.tc.columbia.edu/publications/what-happens-community-college-dual-enrollment-students.html>

**Between one third and one half of community college dual enrollment students do not continue taking dual enrollment courses after their first term.**

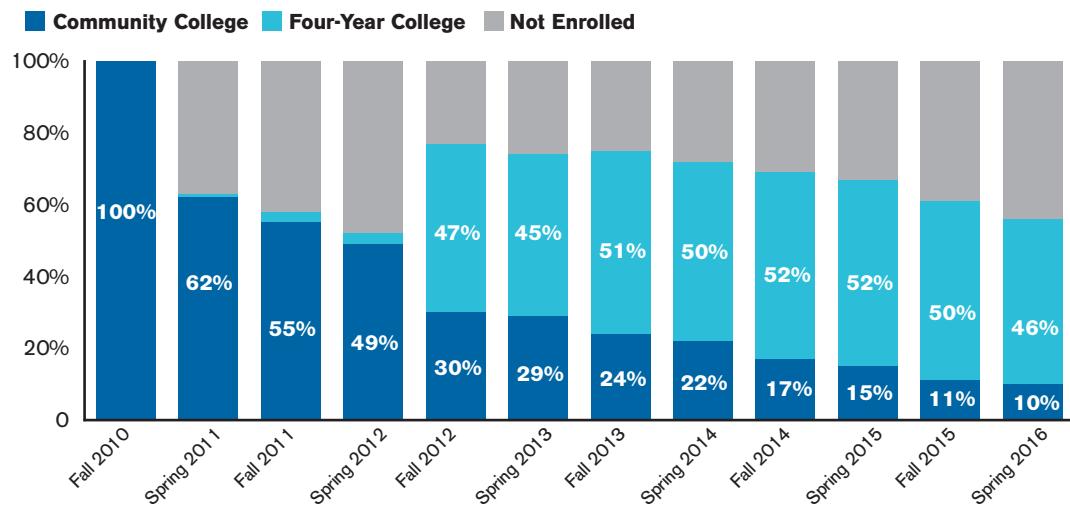
Overall, 30 percent of students who first participated in dual enrollment in fall 2010 had no other college enrollments prior to turning 18, including summer enrollments. In other words, these students only participated in high school dual enrollment at a community college for one term. Furthermore, 42 percent of students who first participated in dual enrollment in fall 2010 participated for only two terms, and 28 percent participated for three terms or more.

Figure 3 shows the proportions of students who first participated in high school dual enrollment at a community college in fall 2010 and who were subsequently enrolled at a community college, enrolled at a four-year college, or not enrolled in any higher education institution for each fall and spring term over six years. Depending on the age at which students began their high school dual enrollment coursework in fall 2010, 34 to 51 percent of students did not continue taking college courses in spring 2011. Students who started dual enrollment when they were 17 years old were the most likely to continue dual enrollment coursework after their first term; only 34 percent of these students did not participate in dual enrollment in the spring 2011 term. Among the nearly 62,000 students who first started dual enrollment coursework in fall 2010 at age 16, presumably with two years left of high school, 42 percent did not take any college coursework in fall 2011, and 48 percent did not enroll in spring 2012. Among students who started dual enrollment in fall 2010 at ages 14 or 15, about half did not enroll at any college for most subsequent terms prior to their presumed high school graduation. Additionally, 14 percent of students who started dual enrollment at age 14 completed a community college credential before turning 18, and only about 4 percent of students who started at ages 15 and 16 completed a credential before age 18. With only one year to complete a credential before turning 18, less than 1 percent of 17-year-old dual enrollment students did so.<sup>12</sup>

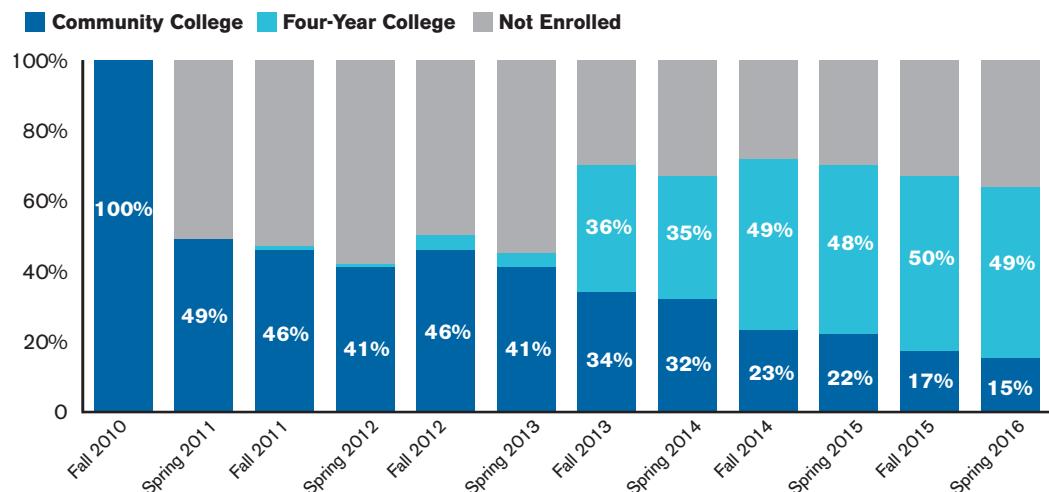
**Figure 3. Dual Enrollment Students' Enrollments by Sector, Fall 2010 Through Spring 2016**



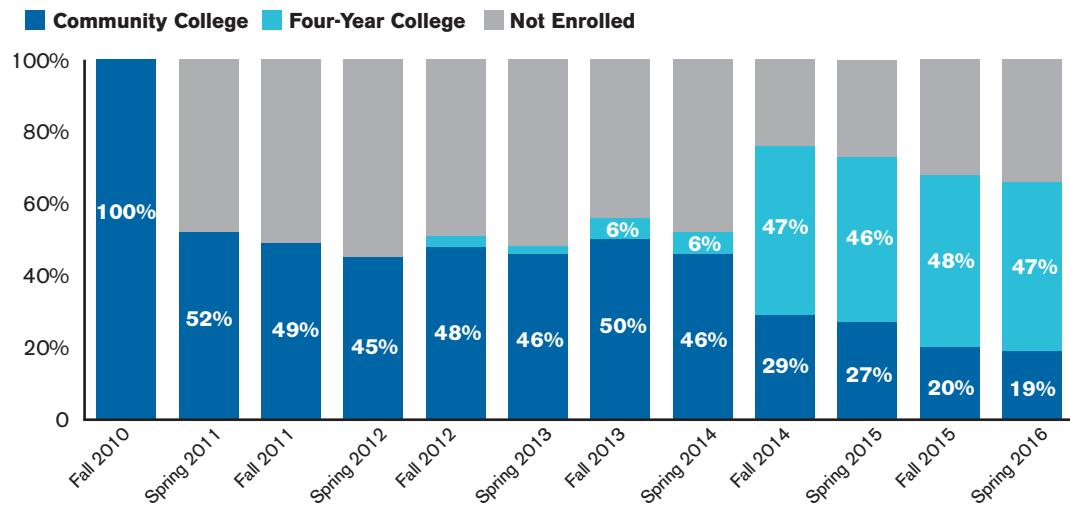
## 16-Year-Olds (N = 61,932)



## 15-Year-Olds (N = 15,482)



## 14-Year-Olds (N = 6,746)

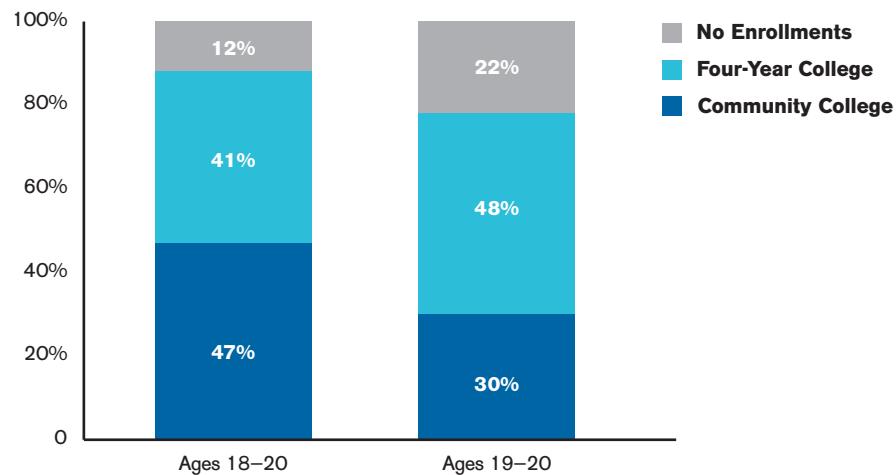


# Where Do Dual Enrollment Students Enroll After High School?

**The vast majority of dual enrollment students enrolled in college after high school. Among college-goers, more than half first attended a community college, although this varied by state.**

To understand what type of institution former dual enrollment students first attend after graduating high school, we tracked students' first college matriculations at ages 18 to 20. Nearly half (47 percent) of all former dual enrollment students first matriculated at a community college between the ages of 18 and 20, and among them, 84 percent reenrolled at the community college at which they took dual enrollment courses in fall 2010.<sup>13</sup> Forty-one percent of former dual enrollment students first matriculated at a four-year college at ages 18–20. Only 12 percent of former dual enrollment students did not enroll at any college at ages 18–20.

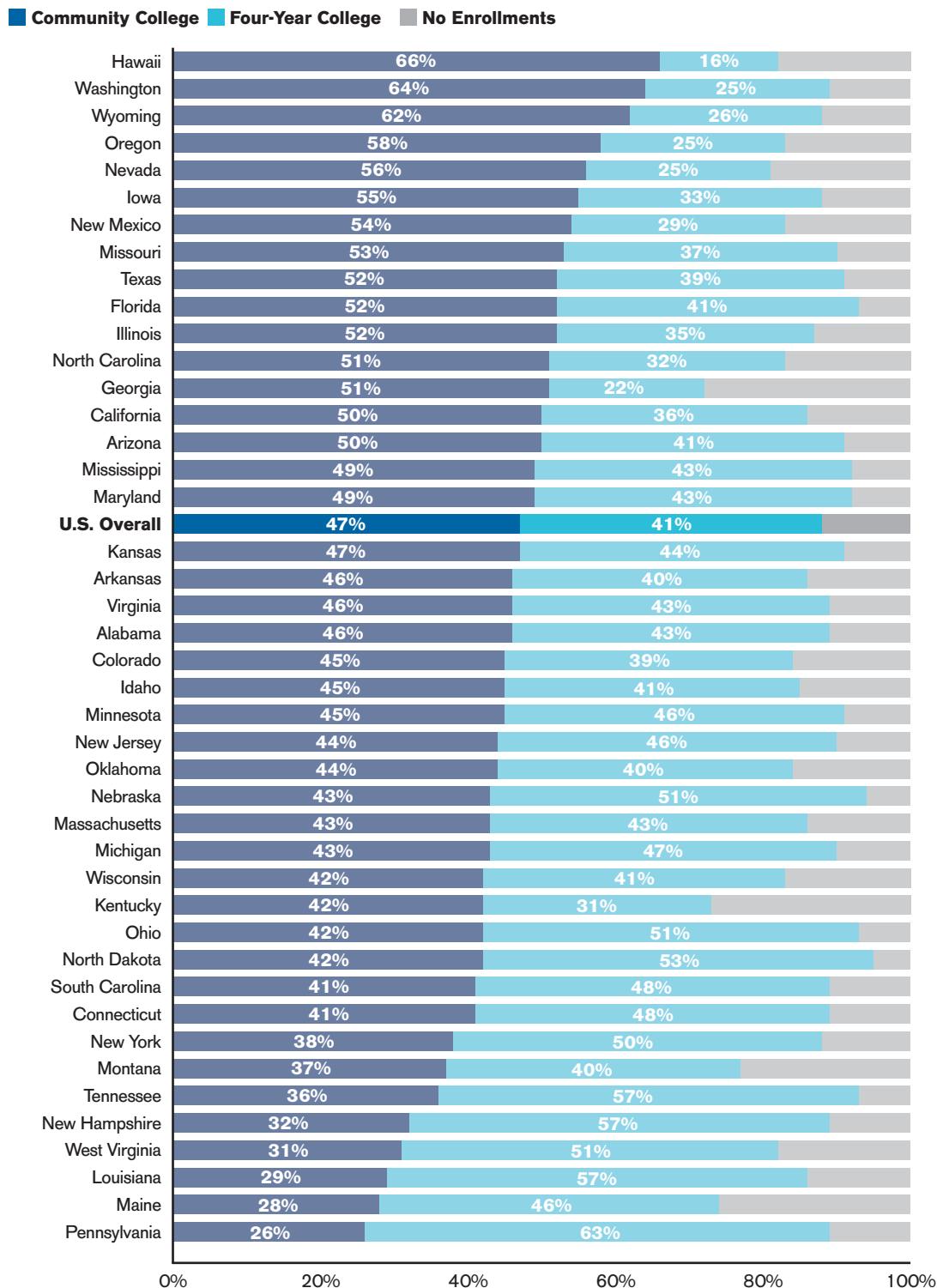
While most students with a fall college enrollment at age 18 have already graduated high school, it is possible that some students might begin their senior year in high school at age 18, and therefore any college enrollments would in fact be high school dual enrollments. In such cases, we would have misclassified students as first attending a community college after high school, thereby overestimating the percentage of former dual enrollment students who first enrolled at a community college at ages 18–20. Therefore, we also tracked former dual enrollment students' first enrollments at ages 19–20, and we found that 30 percent first enrolled at a community college, 48 percent first enrolled at a four-year college, and 22 percent did not enroll at any college (see Figure 4). However, given that some students stop out, drop out, or transfer to a four-year college during their first year at community college, tracking students' first enrollments beginning at age 19 underestimates the percentage of students who first matriculated at a community college after high school and overestimates the percentage of students who first matriculated at a four-year college or attended no college after high school. The actual percentage of former dual enrollment students who first enrolled at a community college after high school is between these two estimates, 30 and 47 percent. We base further analyses on the sample of former dual enrollment students who we assumed first entered college at ages 18–20 so as not to exclude the substantial number of students in the sample who stopped out, dropped out, or transferred after their first year at a community college.

**Figure 4. First College Matriculation Among Former Dual Enrollment Students**

In most states, the vast majority of former dual enrollment students were enrolled in some sort of college when they were 18–20. Only in a handful of states—Georgia, Kentucky, and Maine—did more than 25 percent of such students not enroll in either a community college or a university.

Among former dual enrollment students who did enroll in college soon after high school, the type of institution they first attended at ages 18–20 varied greatly by state, as shown in Figure 5. In Hawaii, Washington, and Wyoming, more than 60 percent of former dual enrollment students first attended a community college at ages 18–20. In other states—Pennsylvania, Louisiana, New Hampshire, and Tennessee—57 percent or more of these students first attended a four-year college at ages 18–20. Examining Figure 5 alongside Figure 2 provides context to the patterns of first college enrollment after former dual enrollment students finished high school. For example, dual enrollment participants comprised 20 percent of community college entrants in Washington, and 64 percent of those students first enrolled at a community college at ages 18–20.

**Figure 5. First Enrollment at Age 18–20 Among Former Dual Enrollment Students, by State**



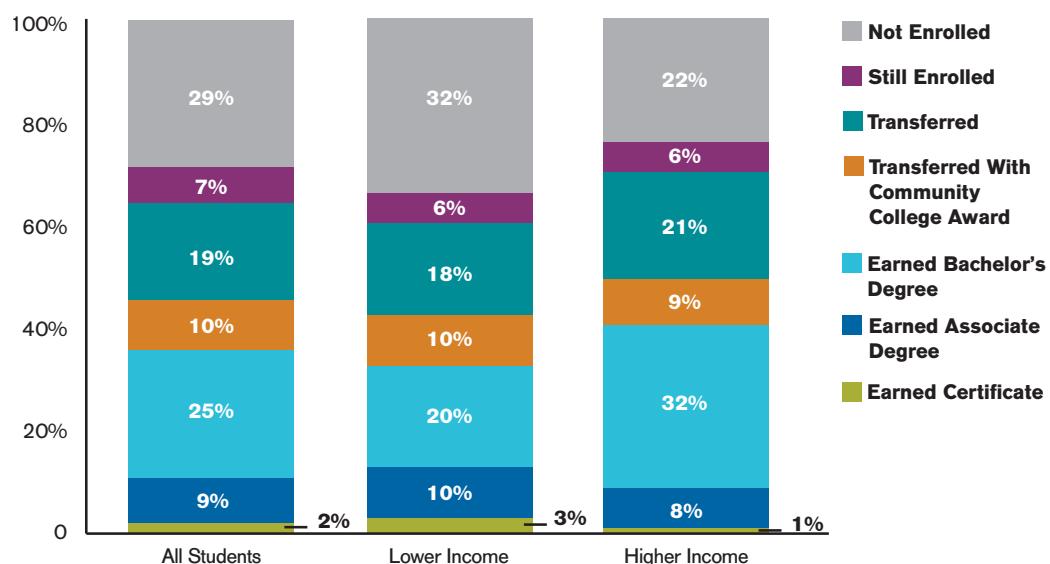
*Note.* For confidentiality, results for states with fewer than three community colleges are withheld. Students who participated in dual enrollment at age 14 are excluded from this analysis due to the limited tracking period. For full results, see the appendix to this report, available at <https://ccrc.tc.columbia.edu/publications/what-happens-community-college-dual-enrollment-students.html>

# What Are Former Dual Enrollment Students' College Attainment Outcomes?

**Nearly half of dual enrollment students who first matriculated at a community college earned a postsecondary credential five years after high school. Achievement gaps between lower and higher income students were largest for bachelor's degree completion rates.**

As shown in Figure 6, 46 percent of students who started dual enrollment at age 17 and first matriculated at a community college between the ages of 18 and 20 completed a college degree or certificate five years after high school. Nearly 20 percent transferred to a four-year institution but had not earned a degree or certificate after five years, and 7 percent were still enrolled at a community college. Among these former dual enrollment participants, 50 percent of higher income students had earned a college credential (including certificates and associate degrees) five years after high school, compared with 43 percent of lower income students. The outcome with the largest difference between lower and higher income students was the bachelor's degree completion rate—20 percent of lower income students earned a bachelor's degree five years after high school, compared with 32 percent of higher income students.

**Figure 6. Highest Outcomes by Income Among Students Who Participated in Dual Enrollment at Age 17 and First Matriculated at a Community College at Ages 18–20**



**Credential completion rates varied by state—both overall and between lower and higher income former dual enrollment students who first matriculated at a community college.**

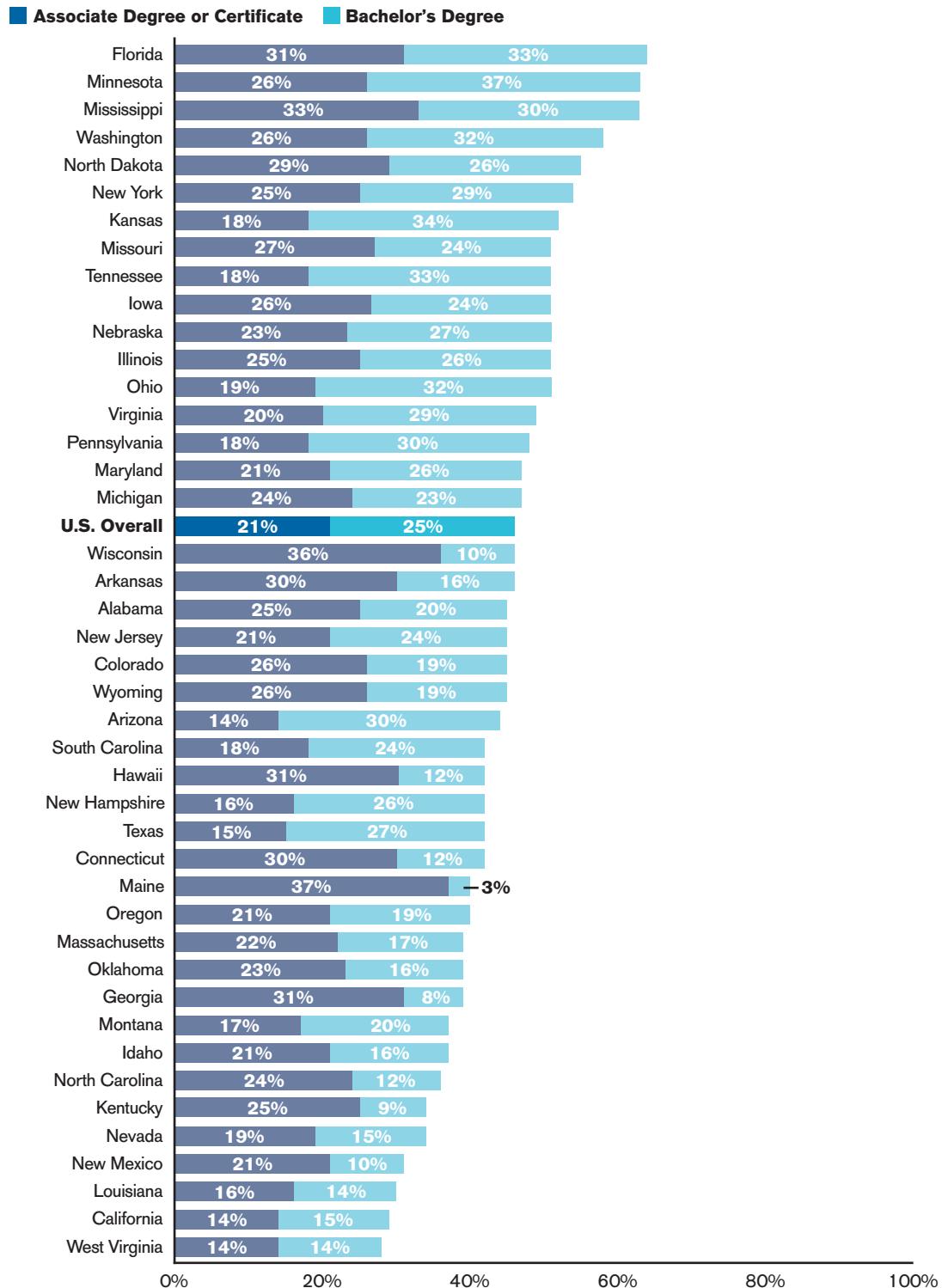
Five years after high school, average rates of completion of any college credential ranged between 28 and 64 percent by state among former 17-year-old dual enrollment students who first matriculated at a community college, as shown in Figure 7. In Florida, Minnesota, and Mississippi, more than 60 percent of these students earned either a community college credential (certificate or associate degree) or a bachelor's degree. Around one third completed bachelor's degrees in Minnesota, Florida, Washington, Kansas, Tennessee, and Ohio. In other states, fewer than 10 percent of students completed bachelor's degrees within five years.

In some of the states with relatively strong overall completion outcomes, such as Florida, New York, Kansas, Tennessee, Illinois, and Ohio, higher income former 17-year-old dual enrollment students had substantially higher completion rates than did their lower income peers. In other states with similarly strong overall outcomes—including Minnesota, Missouri, and Iowa—there was more parity in completion rates between lower and higher income students. In two states, North Dakota and Nebraska, lower income students had markedly higher completion rates than did higher income students. (See Figure 8 for state-by-state results.)

**Nearly two thirds of former dual enrollment students who first matriculated at a four-year college earned a postsecondary award within five years after high school, with most earning bachelor's degrees; however, there was a substantial gap in completion, particularly of bachelor's degrees, between lower and higher income students.**

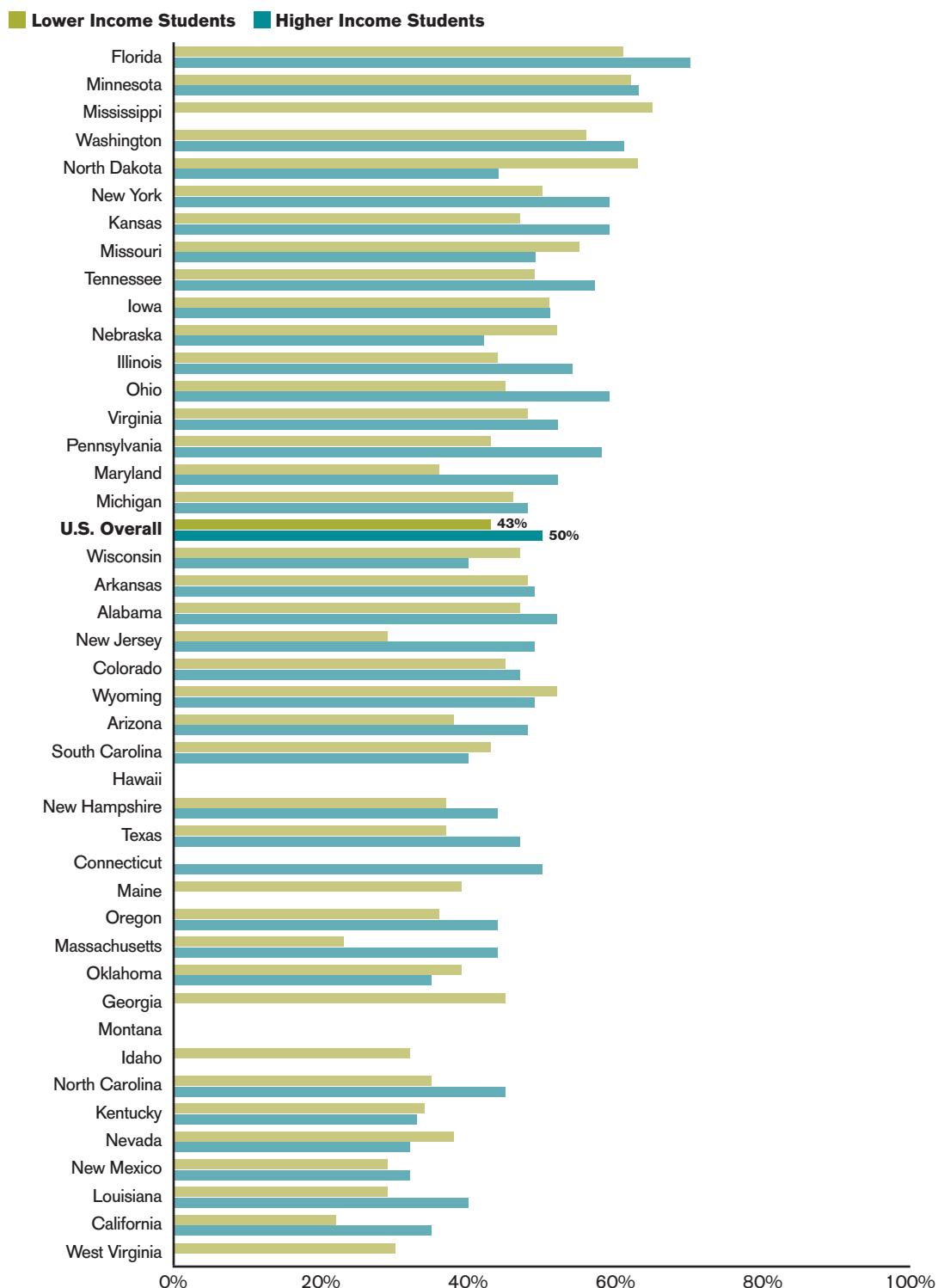
Overall, 64 percent of former 17-year-old community college dual enrollment participants who first matriculated at a four-year college after high school earned a postsecondary credential within five years. Most (59 percent) earned bachelor's degrees as their highest award, while the others earned certificates or associate degrees. As shown in Figure 9, among former dual enrollment students who entered a four-year institution after high school, higher income students were much more likely to complete a bachelor's degree five years after high school (67 percent) than were lower income students (52 percent).

**Figure 7. Highest Award by State Among Students Who Participated in Dual Enrollment at Age 17 and First Matriculated at a Community College at Ages 18–20**



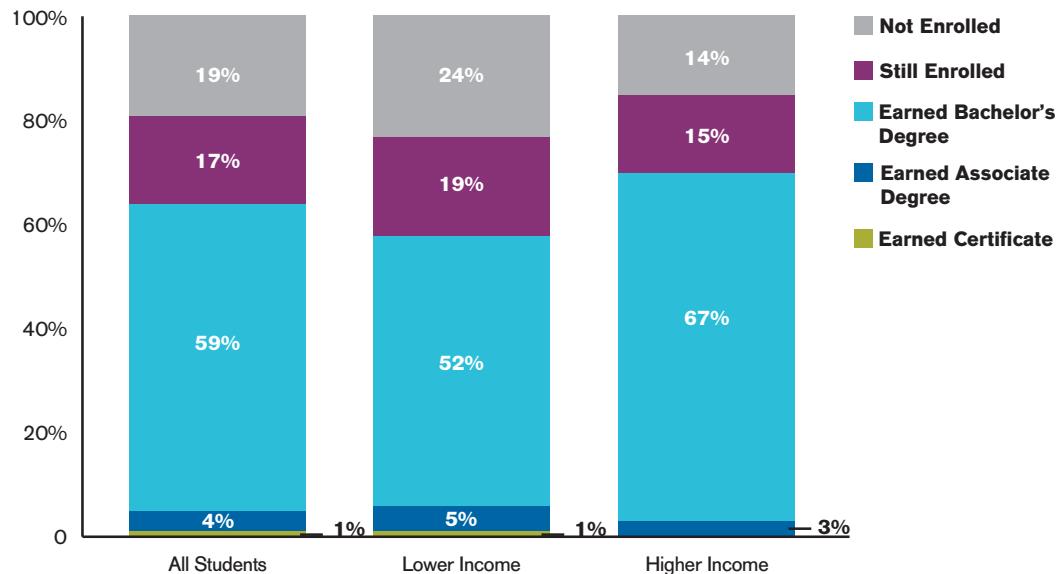
Note. For confidentiality, results for states with fewer than three community colleges are withheld. Results are also withheld for subgroupings of fewer than 30 students.

**Figure 8. Completion of Any Award by Income Among Students Who Participated in Dual Enrollment at Age 17 and First Matriculated at a Community College at Ages 18–20**



*Note.* For confidentiality, results for states with fewer than three community colleges are withheld. Results are also withheld for subgroupings of fewer than 30 students. For full results, see the appendix to this report, available at <https://ccrc.tc.columbia.edu/publications/what-happens-community-college-dual-enrollment-students.html>

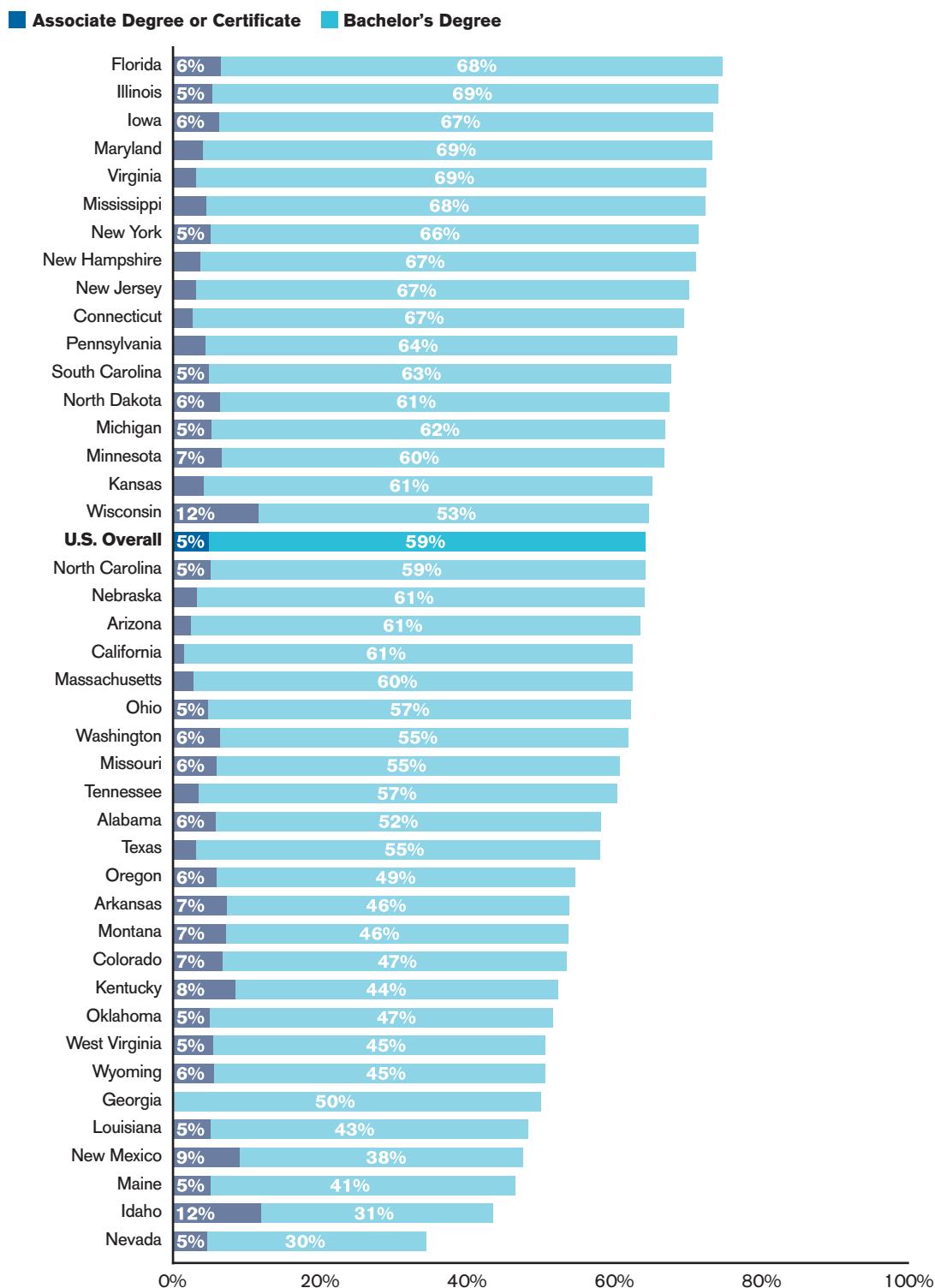
**Figure 9. Highest Outcomes by Income Among Students Who Participated in Dual Enrollment at Age 17 and First Matriculated at a Four-Year College at Ages 18–20**



**There was substantial variation by state in the rate at which former dual enrollment students who first matriculated at a four-year institution earned college credentials; in many states, there were large gaps in attainment between lower and higher income students.**

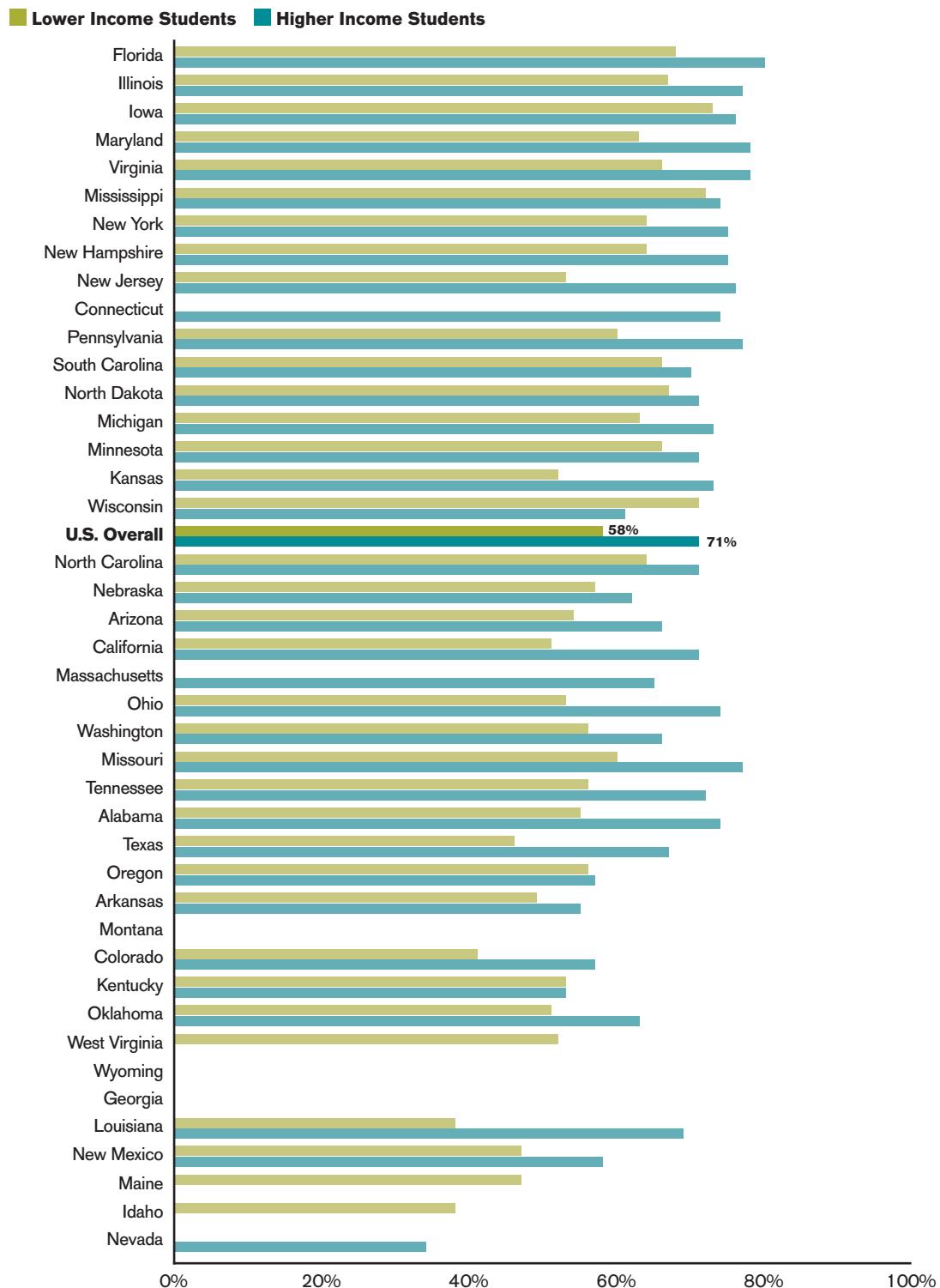
Average completion rates among former 17-year-old dual enrollment students who first matriculated at a four-year college ranged from 34 to 75 percent by state. The percentage of such awards that were certificates or associate degrees as opposed to bachelor's degrees also varied considerably by state. In nine states, including Florida, Illinois, Iowa, Maryland, and Virginia, more than 70 percent of former dual enrollment students who matriculated at a four-year college after high school earned some college credential within five years after leaving high school (see Figure 10). However, most states with relatively strong overall completion rates also had large achievement gaps between students from lower and higher income families (see Figure 11). For example, in Maryland, 78 percent of higher income students completed a credential, compared with 63 percent of lower income students, a gap of 15 percentage points. In some states, including New Jersey, Ohio, California, Kansas, and Texas, the achievement gap in credential completion between lower and higher income students was 20 percentage points or more. Iowa, Mississippi, and South Carolina were above the national average in completion rates among former dual enrollment students who first matriculated at a four-year college and had smaller (2–3 percentage point) achievement gaps between lower and higher income students. In Wisconsin, 71 percent of lower income former dual enrollment students earned a college award, compared with 61 percent of higher income students.

**Figure 10. Highest Award by State Among Students Who Participated in Dual Enrollment at Age 17 and First Matriculated at a Four-Year College at Ages 18–20**



*Note.* For confidentiality, results for states with fewer than three community colleges are withheld. Results are also withheld for subgroupings of fewer than 30 students. For full results, see the appendix to this report, available at <https://ccrc.tc.columbia.edu/publications/what-happens-community-college-dual-enrollment-students.html>

**Figure 11. Completion of Any Award by Income Among Students Who Participated in Dual Enrollment at Age 17 and First Matriculated at a Four-Year College at Ages 18–20**



*Note.* For confidentiality, results for states with fewer than three community colleges are withheld. Results are also withheld for subgroupings of fewer than 30 students. For full results, see the appendix to this report, available at <https://ccrc.tc.columbia.edu/publications/what-happens-community-college-dual-enrollment-students.html>

# Key Takeaways and Further Questions

Students taking community college courses while in high school represent a significant and growing portion of community college students nationally. Taking college courses in high school has the potential to make students more likely to earn a college credential and to do so more efficiently. The data presented in this report provide some new insights into patterns of enrollment and college completion outcomes among dual enrollment students. These insights in turn raise questions for further investigation.

One obvious question is why there is such striking variation among states, not only in the proportion of entering community college students who are dual enrollment students<sup>14</sup> but also in patterns of post-high-school college enrollment and award completion. For example, in Pennsylvania, a relatively small group of students participated in dual enrollment at community colleges (10 percent of new fall enrollments; see Figure 2), and almost two thirds of dual enrollment participants continued at a four-year college after high school (Figure 5), with 64 percent earning a bachelor's degree within five years after high school (Figure 10). In contrast, in Washington, where a relatively large share of students participated in dual enrollment at community colleges (20 percent of new fall enrollments; see Figure 2), almost two thirds of those students continued at a community college after high school (Figure 5), with 58 percent of those students earning a college degree or certificate (32 percent earned a bachelor's; see Figure 7). State support for dual enrollment in Pennsylvania is quite different from support in Washington. For example, Pennsylvania does not provide any state subsidy for dual enrollment students, whereas Washington does. It is clear from these examples that dual enrollment outcomes in a given state need to be examined alongside the extent of participation in dual enrollment and the overall policy context. Overall, college completion outcomes were strong for former dual enrollment students who continued at a community college after high school in states such as Florida, Minnesota, and Mississippi, where more than 60 percent of former dual enrollment students completed any college award. In contrast, half of all former dual enrollment students in California first matriculated at a community college after high school, and less than 30 percent of those students completed any college credential five years after high school.

Another notable finding that warrants further investigation is the fact that nationally, depending on students' age when they first started dual enrollment, between a third and half only took community college dual enrollment courses for one term in high school. Why this is the case, and whether it is a good thing (i.e., should students be taking more or less college coursework in high school?), likely depends on what courses dual enrollment students are taking, how well those courses prepare students for further college-level work, and how efficiently the credits students earn in high school can be applied toward college credentials in each student's major field of interest.

Overall, it is encouraging that nationally only about 12 percent of former dual enrollment students did not enroll in any college soon after high school. However, in a handful of states, the proportion of dual enrollment students who did not attend college at ages 18–20 is substantially higher, which raises the question of why this is the case.

Also intriguing are questions about why some former dual enrollment students attend community colleges while others attend four-year institutions after high school, and whether the patterns we observe are good for students and for states. The patterns do vary by state and likely are related to state-by-state differences in the capacity of two-year versus four-year institutions, historical patterns of college-going, the characteristics of students who participate in dual enrollment, and the prevalence of dual enrollment in four-year public and private institutions.

In our work across the country, we often hear community college educators say that the vast majority of their students who take dual enrollment courses attend four-year institutions after they graduate high school. However, the analysis here indicates that, while there is substantial variation by state, nationally more than half of college-going former dual enrollment students first attend a community college. Even when we look at former dual enrollment students who first enter college after high school at ages 19–20 (a more conservative estimate that helps ensure we are not counting students who are still in high school), nearly 40 percent of college-goers attend community colleges. Furthermore, 84 percent of former dual enrollment students who continued at a community college after high school returned to the community college at which they participated in dual enrollment.

Thus, it appears that community colleges may be “capturing” substantially more dual enrollment students immediately after high school than many seem to think. We suspect that if colleges were more proactive in working with their high school partners to reach out to their dual enrollment students and advise them on the educational opportunities and potential cost savings that community colleges afford, they would thereby be able to increase the yield of their dual enrollment students who go on to enroll at their institutions after high school.

Colleges might also be able to increase the rate at which former dual enrollment students who enroll at their institutions earn a certificate or associate degree before they transfer. Among former dual enrollment students who first matriculated at a community college after high school and subsequently transferred to a four-year institution, only 18 percent earned a credential from their community college before transferring.<sup>15</sup> In a study of two- to four-year transfer outcomes conducted using NSC data on the fall 2007 cohort of FTIC community college students, Jenkins and Fink (2016) found that, among students who transferred from a two-year institution to a four-year institution, only 29 percent earned a certificate or associate degree before they transferred. In addition to providing recognition to the student and community college for pre-transfer academic preparation, completing a community college credential before transferring may carry economic benefits for both students and taxpayers (Belfield, 2013).

While we cannot draw causal conclusions based on these data, the data show that community college dual enrollment students earn college credentials at a higher rate and in a shorter timeframe than do students who start taking college courses after high school. Among former community college dual enrollment students who first matriculated at a community college after high school, 46 percent completed a college credential (certificate, associate degree, or bachelor’s degree) five years after high school. In comparison, only 39 percent of students who started community college after high school in the fall 2010 term earned any college degree or certificate within six years (Shapiro et al., 2017). Furthermore, 64 percent of former community college dual enrollment

students who first matriculated at a four-year institution completed a college credential within five years after high school—the same completion rate among students entering four-year institutions nationally after high school, but within *six* years (Shapiro et al., 2017).<sup>16</sup>

Still, both two- and four-year institutions should investigate why many former dual enrollment students fail to complete any credential in a reasonable timeframe. Over half of the dual enrollment students who first matriculated at a community college after high school had not earned a college credential five years after high school, although 19 percent had transferred to a four-year institution, and 7 percent were still enrolled at a community college (29 percent were no longer enrolled in any institution). Among dual enrollment students who first entered a four-year institution after high school, about a third had not earned a credential five years after high school, although 17 percent were still enrolled (19 percent were no longer enrolled).

One way to increase college completion rates for former dual enrollment students overall would be to address the achievement gaps between higher and lower income students—which exist nationally and in many states. We suspect, based on other research (e.g., Shapiro et al., 2017), that there are also achievement gaps by race/ethnicity, although we lack direct measures of race/ethnicity in this dataset to examine them. In an ancillary analysis employing a method to use census tract data as a proxy for student race/ethnicity,<sup>17</sup> we found there to be about 15–20 percentage point gaps in completion of any college credential five years after high school in favor of former 17-year-old dual enrollment students from predominantly White census tracts compared with students from predominantly African American or predominantly Hispanic tracts.<sup>18</sup> Despite rigorous studies finding positive effects of dual enrollment participation on a range of outcomes, including for lower socio-economic status students (An, 2013; Karp, Calcagno, Hughes, Jeong, & Bailey, 2007) and students of color (Agnello, Gensemer, Paul, Ripple, & Webber, 2017; Taylor, 2015), our descriptive findings and ancillary analysis suggest there is still much work needed to fully understand and address inequitable outcomes among dual enrollment participants by socioeconomic status and race/ethnicity.

We were surprised to find that, at least on average across states, the demographic profile of high school dual enrollment students (see Table 1) was similar in terms of family income to that of the students in our sample who first started college after high school. We would have expected dual enrollment students to be somewhat more likely than post-high-school starters to be from higher income families. This is a promising finding, since it means that colleges could potentially work with dual enrollment students to increase college-going and completion among economically disadvantaged students. However, to realize the potential of dual enrollment as a strategy for college success, colleges need to partner with high schools to investigate the reasons for the gaps in college access and completion between lower and higher income students and find ways to close them.

If colleges are to improve rates of college-going and completion by dual enrollment students generally, and those from disadvantaged backgrounds in particular, they will need to monitor their dual enrollment students more closely, both while they are still in high school and after they graduate. Colleges can begin by running analyses using the outcome measures presented in this analysis, and they can merge NSC data with their own student records to further disaggregate outcome data by income, race/ethnicity, and other student characteristics of interest. Using the results presented here, they could benchmark their performance against aggregate outcomes for

other two- or four-year institutions nationally and in their state. The findings from such analyses will be a good starting point for colleges, working with their high school partners, to examine what strategies are working to help dual enrollment students enroll in college after high school and earn college credentials in a timely fashion, and what additional steps are needed to improve college access and success for all students.

## Conclusion

The number of high school students taking college courses at community colleges has grown dramatically since the early 2000s. To the extent that dual enrollment enables students to “get a head start” on college, it holds great potential for improving college access and completion rates and lowering the cost of degrees for students and their families. This report sheds light on what happens to dual enrollment students after high school. We observed considerable variation among states in student progression to higher education after high school and success in earning college credentials. We found substantial gaps in college success between lower income former dual enrollment students and those from higher income families. We encourage colleges and states to monitor dual enrollment students, both while they are in high school and after they graduate, using the measures and results presented in this report to benchmark their performance nationally and by state. Doing so would be a good way to motivate efforts to work with partner high schools in order to more fully realize the potential of dual enrollment to increase college success and affordability for all students and improve return on investment for states.

## Endnotes

1. These figures represent authors' calculations of the growth in the number of high school students taking any type of college course, within or outside of a dual-credit program, from the 2002–03 academic year to the 2010–11 academic year (Kleiner & Lewis, 2005, Table 2; Marken, Gray, & Lewis, 2013, Table 1). At public two-year colleges specifically, the number of high school students taking college courses grew 58 percent between 2002 and 2010, to a total of 980,000 students.
2. While NCES has not collected national data on dual enrollment participation for academic years later than 2010–11, IPEDS fall enrollments among students aged 17 or younger suggest substantial growth in dual enrollment since then.
3. These figures are based on authors' calculations using data from the Texas Higher Education Coordinating Board (2017).
4. For students who are 17 or younger, IPEDS collects only fall enrollment data. Enrollment figures for the full academic year would be even larger.
5. This is the same method that previous NSC reports have used to classify students as high school dual enrollment participants. A limitation of using age as a proxy for dual enrollment participation is that the method may misclassify students who graduated from high school one or more years ahead of, or behind, the typical student.
6. We used the same cohort definition as Jenkins and Fink (2016), which included only "degree-seeking" students, defined as students who either enrolled in at least one full-time term in the first 12 months or enrolled in at least two part-time terms in the first 18 months. NSC uses a similar definition in tracking degree outcomes for entering college students.
7. Students were identified as coming from census tracts in the top two (higher income) or bottom two (lower income) quintiles nationally for median household income. For more information on how student family income measures were derived, see Jenkins and Fink (2016).
8. Using the same definitions as Jenkins and Fink (2016), we counted fall and spring enrollments of 60 or more days and summer enrollments of 30 or more days as valid enrollments.
9. We examined three types of undergraduate credentials: bachelor's degrees, associate degrees, and certificates.
10. Comparing its database to IPEDS enrollments, NSC reported a national coverage rate of 97 percent for fall 2010 enrollments at public two-year institutions. Coverage varies by state; there were nine states with less than 90 percent coverage. For confidentiality, we are not reporting findings for state outcomes with fewer than three institutions in the dataset or for subgroups with fewer than 30 students. Detailed information on coverage for the fall 2010 cohort can be found at <https://nscresearchcenter.org/workingwithourdata/>.
11. We would have expected that dual enrollment students would be more likely to be from higher income families than students who enter community college after high school (An, 2013; Taylor, 2015). However, our observations are not necessarily a reflection of all high school dual enrollment participants, as we were only able to observe high school students who took courses at community colleges and not those who took courses at four-year institutions.
12. Only about 2 percent of high school dual enrollment students overall completed a community college credential prior to turning 18, the age at which they presumably graduated high school.
13. This rate ranged from 56 to 96 percent by state.

14. The data we use in this report are from fall 2010. We know that nationally the number of high school students enrolled in community college courses has grown since then. The proportion of dual enrollment students among all community college students may also have changed since then, both nationally and in particular states. Furthermore, we are not able to report on the prevalence of high school dual enrollment at four-year institutions.
15. This is based on further calculations not shown in this report.
16. The comparison to the cohorts from Shapiro et al.'s (2017) NSC Research Center report may even underestimate these differences in outcomes advantage, given that the NSC cohorts include students who formerly participated in high school dual enrollment.
17. Researchers trying to assess the racial/ethnic composition of health insurance plans and racial/ethnic disparities in mortgage lending policies have advanced methods to create proxies for race/ethnicity when this information is not available through self-reports. The most sophisticated methods use Bayesian algorithms to predict race/ethnicity using a combination of information from census geographies and surname databases (Consumer Financial Protection Bureau, 2014). Proxies using only census geographies or only surname lists are less accurate than those using the two in combination (Elliott, Fremont, Morrison, Pantoja, & Lurie, 2008). Researchers in the health fields have recommended the use of census geographies as a proxy for race/ethnicity and have found this method to be particularly useful in estimating the proportion of health insurance plan members who are African American and to identify racial/ethnic disparities in health care. The limitations of this method include that it is less accurate for Hispanic and Asian populations and that its accuracy depends on the degree of racial/ethnic segregation in a given area (Fiscella & Fremont, 2006).
18. We identified census tracts in the top quintile for racial/ethnic homogeneity as predominantly White (non-Hispanic), African American (non-Hispanic), or Hispanic, resulting in a sample of 27,181 former dual enrollment students from tracts with more than 91 percent White residents (54 percent completion rate), 12,701 students from tracts with more than 19 percent African American residents (41 percent completion rate), and 17,481 students from tracts with more than 26 percent Hispanic residents (35 percent completion rate). We found similar results when we varied these definitions by using the 90th percentile (as opposed to the top quintile) as a cut point and by using census tracts with more than 67 percent majority residency for each racial/ethnic category. Given the methodological limitations of using census data without surnames as a proxy for race/ethnicity (see note 17), we report these findings as estimates to encourage further research to more precisely measure racial/ethnic disparities in degree attainment among former dual enrollment students.

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